

at first external and then ventral to the motor portion of the internal capsule, and so reaches the tegmentum. The lines from the two sides meet in the interpeduncular grey matter at the level of and just behind the exit of the 3rd nerve.

2. *Hyperinspiratory Clonus* ("snuffing movements").—This effect was obtained by excitation at the junction of the olfactory bulb and tract, and then carrying the stimulation backwards along the olfactory tract; the same result was found when the uncinate convolution of the temporo-sphenoidal lobe was irritated. Followed from the uncus this excitable region passed behind the optic tract to the crus, and then lay ventrally to the crista. The excitable tract on each side thus converged towards the middle line at the upper border of the pons.

3. *Hyperinspiratory Tonus*.—This experimental result is of such frequency and constancy as to be clearly an important general phenomenon. It can be elicited in various ways: *e.g.*, excitation of the descending motor tract in the corona radiata and internal capsule yielded this result; so did excitation of the 5th nerve and dura mater, as well as the sciatic nerve, both before and after complete removal of the cerebrum at the tentorium cerebelli.

The author finds medullated fibres in prepared microscopical vertical (frontal) sections of the brain running in the same course as that indicated by faradic excitation of the living surface of the section of the hemisphere. For his conclusions he has relied solely upon tracings of the respiratory movements. Fifty-six tracings are included as illustrations, together with thirty photographs of brains and brain sections to show the precise points excited. The author records his thanks to Mr. Horsley for help, and to Dr. Howard Tooth for the loan of excellently-prepared sections.

IV. "The Pathology of the Œdema which accompanies Passive Congestion." By WALTER S. LAZARUS-BARLOW, M.B., M.R.C.P. Communicated by Professor ROY, F.R.S. Received December 22, 1893.

(From the Pathological Laboratory, Cambridge.)

(Abstract.)

The author reviews the literature of the subject, and points out that the question of time has not been sufficiently considered by previous investigators.

He examines the view which, at present, is usually accepted, and which explains the œdema accompanying passive congestion upon purely mechanical principles.

He estimates the occurrence or non-occurrence of œdema by the specific gravity of the blood and blood-plasma, arterial and venous, of muscle and of skin, regarding these as more delicate tests of the presence or absence of œdema than the rougher methods of inspection, measurement, and pitting on pressure.

Having raised the pressure in the femoral vein to 50 mm. of mercury, he finds that there is no alteration in the specific gravity of the blood or blood-plasma of the muscle or of the skin, nor is there any increase in the amount of the lymph-flow, though such a pressure be maintained constant for an hour.

In the affected limb only is any change to be noted, and here there is a rise in the specific gravity of the venous blood and blood-plasma, which depends upon the longer sojourn of the blood in the limb and the consequent greater removal of the more watery portion from a given volume of blood.

Inasmuch as it is essential upon a purely mechanical explanation that the exudation from the blood-vessels should be increased in amount synchronously with the increase of pressure, and no such exudation is found to take place during an hour after the pressure in the veins has been raised, the author considers that the mechanical explanation is not supported by facts.

Since all forms of œdema are accompanied by an insufficient supply of blood to meet the requirements of the tissues, the author investigated the effect of different varieties of anæmia upon the occurrence of œdema. The varieties investigated were:—

1. Prolonged complete anæmia, lasting three hours.
2. Hæmostasis, or cutting-off of the limb, with whatever blood and lymph it may contain, from the rest of the circulation, by means of a tight ligature, for one hour.
3. Complete anæmia combined with stimulation of the sciatic nerve, and persistence, *in situ*, of the products of muscle-metabolism, the whole lasting one hour.

After each of these three varieties of anæmia the effects of active congestion, and of venous obstruction, were separately considered.

It was found that œdema occurs, as shown by a fall in the specific gravity of the muscle and skin, and a rise in the specific gravity of the blood, after all these conditions of anæmia, and the author concludes, therefore, that starvation of the tissues plays an important part in the occurrence of œdema.

The amount of œdema obtained, however, was found to be greater in those cases in which the limb had been subjected to the action of venous blood, and the longer the action of the venous blood was allowed to obtain, the greater the amount of œdema. The author concludes that the presence of the products of tissue metabolism at

the site of their formation plays a part in the occurrence of œdema even more important than that played by starvation.

The greatest amount of œdema was obtained with venous obstruction after anæmia and stimulation of the sciatic nerve.

The author shows that stimulation of the nerve of a muscle normally produces changes which lead to an absorption of water by the muscle, and he concludes that the œdema which accompanies passive congestion depends upon an excess of the normal process whereby the nutrition of the tissues and the removal of the waste products of their metabolism are carried out, the supply of lymph being excessive only because the demands of the tissues are excessive.

The part played by the blood-vessels the author regards as somewhat uncertain. Sharing in the general starvation of the limb, their function must be modified in some as yet unrecognised way; nevertheless, he considers that the part played by them is subordinate to the part played by the tissues outside the blood-vessels.

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Transactions.

Berlin :—Gesellschaft für Erdkunde. Zeitschrift. Bd. XXVIII. No. 5. 8vo. *Berlin* 1893. The Society.

Boston :—Colonial Society of Massachusetts. Bye-Laws, with Certificate of Incorporation and Lists of Officers and Members. 8vo. *Boston* 1893. The Society.

Brussels :—Académie Royale des Sciences. Annuaire. 1894. 8vo. *Bruzelles*. The Academy.

Cambridge, Mass. :—Museum of Comparative Zoology, Harvard College. Annual Report of the Curator. 1892–93. 8vo. *Cambridge* 1893. The Museum.

Halle :—K. Leopoldinisch-Carolinische Deutsche Akademie der Naturforscher. Nova Acta. Bände LVII—LVIII. 4to. *Halle* 1892–93; Leopoldina. Heft 28. 4to. *Halle* 1892; Katalog der Bibliothek. Lief. 4. 8vo. *Halle* 1893. The Academy.

London :—British Museum. Catalogue of Printed Books. Peasant—Penhydd, Periodico—Pentenyi. 4to. *London* 1893.

The Trustees.
Royal United Service Institution. Journal. Vol. XXXVIII. No. 191. 8vo. *London* 1894. The Institution.

Society of Biblical Archæology. Proceedings. Vol. XVI. Parts 1–2. 8vo. *London* 1893. The Society.

Naples :—Accademia delle Scienze Fisiche e Matematiche. Rendiconto. Serie 2. Vol. VII. Fasc. 8–12. 4to. *Napoli* 1893. The Academy.